Title: METHOD FOR DETERMINING ATTITUDE OF AN OBJECT
Attorney Docket No.: 7784-000389; Boeing Ref. No.: 01-312 (010011)
Serial No: 10/006,010; Filed: 12/04/01; Inventor: Thomas P. Weismuller
Mark D. Elchuk - (248 641-1600)
Harness, Dickey & Pierce, P.L.C.

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FIG. 1

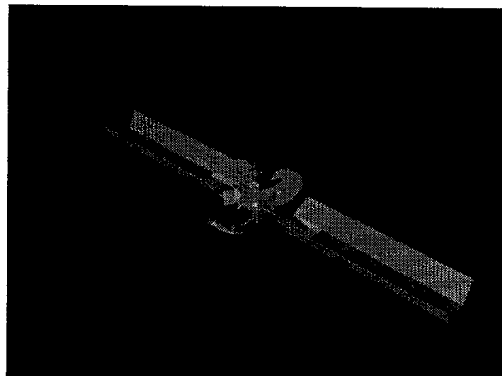| For Binary Comparison:	For Full Intensity Comparison:
Read number of detections in library image ($N_{library}$)	Read number of detections in library image ($N_{library}$)
Set the intensity of all above-zero pixels to a value of one	Determine average pixel intensity of above-threshold pixels ($\bar{I}_{library}$)

FIG. 2

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FIG. 3

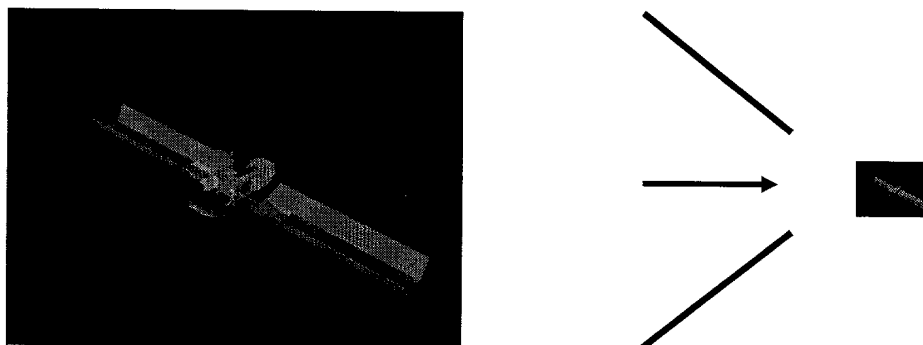| For Binary Comparison:	For Full Intensity Comparison:
Determine number of detections of object image (N_{object})	Determine number of detections of object image (N_{object})
Offset origin of object image (($\breve{X}_{object}, \breve{Y}_{object}$)) to upper left corner = (0, 0)	Offset origin of object image (($\breve{X}_{object}, \breve{Y}_{object}$)) to upper left corner = (0, 0)
	Determine average pixel intensity of above-threshold pixels $\bar{I}_{object}$)

FIG. 4
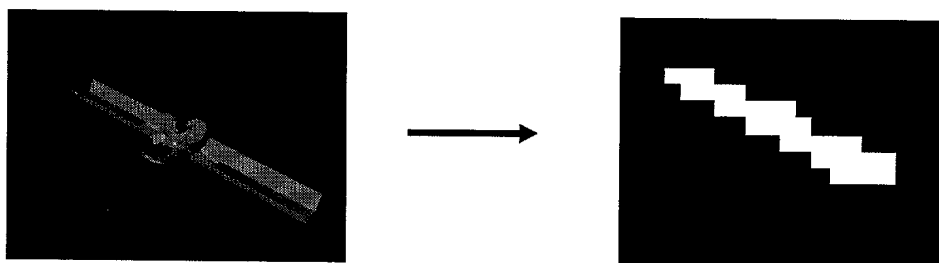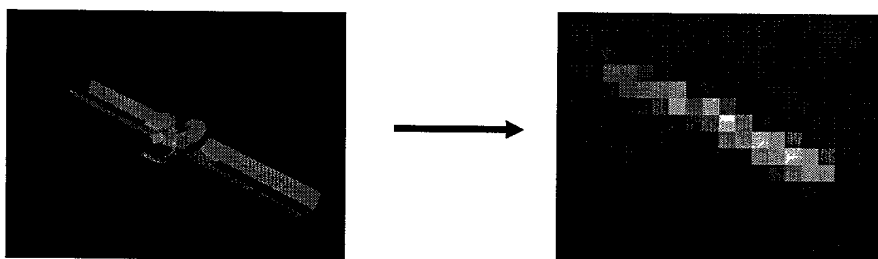
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FIG. 5

FIG. 6

FIG. 7

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FIG. 8a

Fit Variance vs. Yaw Misfit
Various Image Resolution
(No Pitch or Roll Misfit)
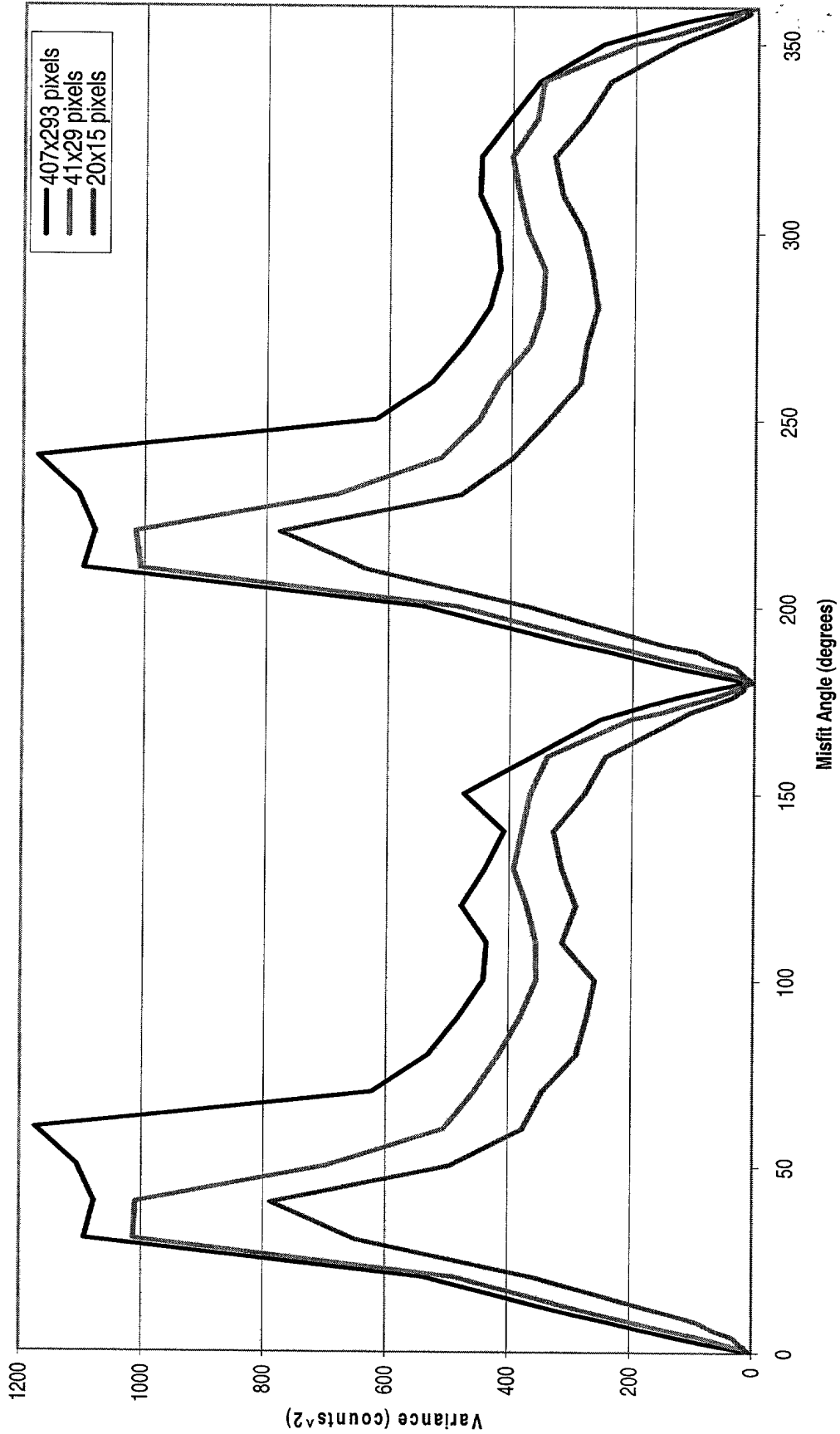
True position = 0 Y, 0 P, 0 R
Sun = 400, 400, 400
Earth = 1000, 8.75, -1192
Camera = 200, 200, 200 (50 mm)

Legend:
407x293 pixels
41x29 pixels
20x15 pixels

X-axis: Misfit Angle (degrees)
Y-axis: Variance (counts^2)

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FIG. 8b

Fit Variance vs. Pitch Misfit
Various Image Resolution
(No Yaw or Roll Misfit)

True position = 0 Y, 0 P, 0 R
Sun = 400, 400, 400
Earth = 1000, 8.75, -1192
Camera = 200, 200, 200 (50 mm)

Legend:
— 407x293 pixels
— 41x29 pixels
— 20x15 pixels

Variance (counts^2)

Misfit Angle (degrees)

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FIG. 8c

Fit Variance vs. Roll Misfit
Various Image Resolution
(No Yaw or Pitch Misfit)

True position = 0 Y, 0 P, 0 R
Sun = 400, 400, 400
Earth = 1000, 8.75, -1192
Camera = 200, 200, 200 (50 mm)

407x293 pixels
41x29 pixels
20x15 pixels